Press Release

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ASTA-Supported Research Finds Cure to Poultry Disease

A recently discovered viral neutralizing factor is being used to improve disease prevention in chickens, and has potential for use in the immunization of other animals to viral diseases -- quite possibly including humans.

The study was funded, in part, by the Arkansas Science & Technology Authority (Authority).

"This is an example of what can be accomplished through the combined efforts of University scientists, private industry and other agencies who support University of Arkansas research," said Dr. Charles Scifres, dean of the University of Arkansas College of Agricultural, Food and Life Sciences.

According to the College of Agricultural, Food and Life Sciences and the Arkansas Agricultural Experiment Station, the factor was discovered by a former University of Arkansas poultry scientist.

Embrex Inc., the University of Arkansas, and three co-inventors who are now or were formerly University of Arkansas faculty members, are listed on a patent for the viral neutralizing factor, known as VNF. The factor is produced by Embrex, a biotechnology company based in Research Triangle Park, NC.

Poultry geneticist Dr. Roy Gyles and his colleagues developed the Rous sarcoma "regressor line" of chickens at the University of Arkansas in the 1960s and '70s. A Rous sarcoma is a tumor caused by a virus that kills normal chickens, but it is "regressed," or absorbed into the tissue, of regressor line chickens with no ill effects.

Dr. Craig Whitfill, Embrex manager of clinical research and development, who has a Ph.D. degree in biochemistry from the University of Texas, and is a former University of Arkansas faculty research associate, joined Gyles, an animal science professor emeritus, in 1976 to look for biochemical mechanisms associated with tumor regression in the regressor line.

Whitfill discovered a "low molecular weight factor" in the blood that appeared to have viral neutralizing activity.

He then secured grant funding for an Arkansas Agricultural Experiment Station research project to test the hypothesis that the blood serum contained a viral neutralizing factor. Grants from the Arkansas Science & Technology Authority, USDA, the Arkansas

Poultry Federation and the National Cancer Institute supported the work by Whitfill and Dr. John Thoma of the University of Arkansas Department of Chemistry.

Results of that research were used to initially patent the viral neutralizing factor concept. Subsequent work by Whitfill at Embrex determined that VNF is not exclusive to the regressor line, but is produced in the blood of any chicken infected with the appropriate vaccine virus.

With the VNF for infectious bursal disease now being produced commercially, work is continuing to develop VNFs that are specific to other viruses that affect poultry and other animals, Whitfill said. A patent declaration has been filed to extend VNF coverage to other poultry vaccines as well as vaccine viruses for other food animals, pets and humans.

The University of Arkansas will receive license revenues from any future VNF products.

Scifres said the University recently received its first license revenue payment of $40,000 from Embrex.

Substantial additional revenue for the University is expected from use of VNF in poultry and other animal health products, Scifres said. The University is also named in four related patents issued to or filed by Embrex.

Whitfill described the research that led to the VNF discovery.

Whitfill, Thoma and Gyles are listed as co-inventors on the initial VNF patent approved in 1991, Embrex was licensed by the University in 1988, after the patent application was filed, to develop VNF for commercial use, and Whitfill joined the company at that time.

Ken West, Embrex vice president of sales, marketing and business development, formulated a research agreement between Embrex and the University for further development of the VNF technology.

Two subsequent VNF patents were issued in March 1995 covering method of treatment of infectious bursal disease (IBD), also called gumboro, which is a viral disease that weakens the immune system in chickens. These patents define VNF as antibody, antibody fragments or antiserum, which produce a VNF/vaccine complex when combined with appropriate viruses.

Embrex, established in 1985, markets its patented INOVOJECT automated in-ovo (in-egg) vaccine delivery system that is now widely used in broiler chicken hatcheries. The viral neutralizing factor is one of several biological products the company is developing.

Embrex currently sells VNF to Sanofi Animal Health Inc., recently purchased by Rhone Meieux, which mixes the VNF with its vaccine for prevention of infectious bursal disease.

Whitfill explained that VNF is added to the vaccine to delay the onset of vaccine infection, which makes the complex safe for embryonic and one-day-of-age vaccination. As the vaccine virus emerges and infects, active immunity develops.

One-day-of-age or in-egg delivery of the VNF/IBD Vaccine Complex produces life-long IBD protection in the broiler, thus eliminating the need for multiple vaccinations of mild and intermediate vaccines.

The VNF/IBD Vaccine Complex formulated by Whitfill was licensed with the help of Dr. Vergil Davis of Sanofi Animal Health in January by the USDA for vaccination of one-day-old chicks. Data are being collected and submitted to meet USDA licensing

requirements for in-egg administration. Injecting the vaccine into the egg assures that every chick receives a precise dose.

The proper mixture of VNF and IBD vaccine was determined in research directed by Whitfill and conducted at Embrex, in the University of Arkansas Poultry Science Department and by Tyson Foods and Campbell Soup Company. The tests have shown that day-of-age or in-egg application of the IBD Vaccine Complex works as well as or better than a conventional immunization program.

Others who have assisted in this research include Dr. Kirk Skeeles and Patty Andrews at the University, Dr. Eid Haddad at Embrex and Dr. Pat Wakenell at the University of California, Davis.

Other Embrex personnel who have worked closely with Whitfill include Dr. Tom Frederickson, Dr. Catherine Ricks, Dr. Julius Tyczkowski, Dr. Alan Avakian and Dr. Rick Gildersleeve.